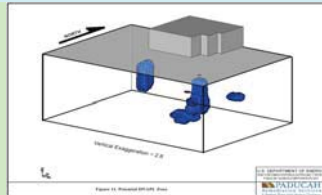


External Technical Review Summary

United States Department of Energy Office of Environmental Management (DOE-EM)

External Technical Review of Building C-400 Thermal Treatment 90% Remedial Design Report and Site Investigation, Paducah Kentucky

Why DOE-EM Did This Review



The groundwater underlying the Paducah Gaseous Diffusion Plant (PGDP) is contaminated by chlorinated solvents, principally trichloroethylene (TCE), as well as other contaminants. TCE was released as a dense nonaqueous phase liquid (DNAPL) to the subsurface soils and groundwater as a result of operations that began in 1952. The Building C-400 area is coincident with the highest TCE concentrations in the groundwater plumes at PGDP. Based on all characterization data collected to date, DNAPL residing in the Building C-400 locality represents a dominant historical and current source of TCE solvent contributing to the large PGDP groundwater plume(s). *The external review objective was to assess the proposed Electrical Resistance Heating (ERH) approach for reducing residual solvent sources present in soil and groundwater in the vicinity of Building C-400 at the PGDP to meet the interim remedial action objectives of the Record of Decision.*

What the ETR Team Recommended

- The data provide an initial basis for design/operation; however, characterization should include expanding the target treatment zones in critical areas, sampling verification during system installation to allow for adjustments, enhanced groundwater monitoring, and future sampling downgradient of the treatment zone.
- To monitor and improve performance, the TCE in the liquid recovered should be evaluated, additional technically-based metrics should be developed, the

heating target should be increased in the saturated zone beyond the co-boiling point of the TCE, and broader ERH exit strategy goals should be incorporated into the metrics.

- Based on the complex hydrogeologic setting and prior evaluations, implementation should incorporate site-specific and verified design models and sufficient flexibility and contingency.

What the ETR Team Found

The ETR Team found that C-400 TCE source zone clean-up is a challenging application of the selected Electrical Resistance Heating technology in a unique and complex setting. A significant effort with extensive analysis was evident in the 90% Remedial Design Report. The team agreed that ERH is a potentially viable remedial technology to meet the remedial action objectives adjacent to C-400. The ETR Team believes that additional efforts are needed to provide an adequate basis for the planned ERH design, particularly in the highly permeable Regional Gravel Aquifer, where sustaining target temperatures will present a challenge. The following areas also should be considered and addressed before implementation of thermal treatment:

- Accurate, site-specific models to support the ERH design for fullscale implementation for this challenging hydrogeologic setting
- Flexible project implementation and operation to allow to response to observations and data collected during construction and operation
- Defensible performance metrics and monitoring, appropriate for ERH
- Comprehensive (creative and diverse) contingencies to address the potential for system under-performance, and other unforeseen conditions.

To view the full ETR reports, please visit this web site:
<http://www.em.doe.gov/Pages/ExternalTechReviews.aspx>

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The purpose of an External Technical Review (ETR) is to reduce technical risk and uncertainty. ETRs provide pertinent information for DOE-EM to assess technical risk associated with projects and develop strategies for reducing the technical risk and to provide technical information needed to support critical project decisions. Technical risk reduction increases the probability of successful implementation of technical scope. In general, ETRs assesses technical bases, technology development, and technical risk identification and handling strategies.



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